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EXAMINER

GOLDBERG, BRIAN J

ART UNIT	PAPER NUMBER
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2861

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/789,040	Applicant(s) RAMAN, GOPALAN	
	Examiner Brian Goldberg	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 43-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 43-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-8 and 43-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 1, the limitation that "an absolute value of the second angle is less than an absolute value of the first angle" is not disclosed in the specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Baughman et al. (US 5608436).
5. Regarding claim 1, Raman discloses "a chamber (101 of Fig 1); a first fluid channel and a second fluid channel each communicated with the chamber (301, 303 of Fig 4); a first peninsula extended along the first fluid channel and a second peninsula

extended along the second fluid channel (401, 403 of Fig 4); and a first sidewall extended between the first peninsula and the chamber, and a second sidewall extended between the second peninsula and the chamber (walls between 401, 403 and 109 in Fig 4), wherein the first sidewall is oriented at a first angle to the chamber and the second sidewall is oriented at a second angle to the chamber (see Fig 4)." Thus Raman meets the claimed invention except "wherein an absolute value of the second angle is less than an absolute value of the first angle."

6. Baughman et al. teach "wherein an absolute value of the second angle is less than an absolute value of the first angle (the two angled sidewalls of 24a of Fig 2a)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the absolute value of the angle of one sidewall less than the absolute value of the angle of the other sidewall. One would have been motivated to so modify Raman for the benefit of improving the damping of fluid motion to achieve the desired fluidic pressure or resistance in the chambers to ensure that fluid is adequately fired from the nozzles.

7. Regarding claim 2, Raman further discloses "a resistor formed in the chamber (109)."

8. Regarding claim 3, Raman further discloses "a width of the first fluid channel along the first sidewall and along a portion of the first peninsula is substantially constant, and a width of the second fluid channel along the second sidewall and along a portion of the second peninsula is substantially constant (the widths of the channels as seen in Figs 3 and 4 are substantially constant)."

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9. Regarding claim 4, Raman further discloses "an island separating the first fluid channel and the second fluid channel (203)."

10. Regarding claim 5, Raman further discloses "the island is asymmetrical (see 203 of Fig 4)."

11. Regarding claim 6, Raman further discloses "the island has a first side oriented substantially parallel with the first peninsula and a second side oriented substantially parallel with the second peninsula (the side labeled L1' is substantially parallel to 401 and the side labeled L2' is substantially parallel to 403 in Fig 4)."

12. Regarding claim 7, Raman further discloses "the island has a first chamfered corner oriented substantially parallel with the first sidewall and a second chamfered corner oriented substantially parallel with the second sidewall (the upper corners of 203 in Fig 4 are chamfered creating sides parallel to the sidewalls of 401 and 403)."

13. Regarding claim 8, Raman further discloses "the first sidewall and the second sidewall are substantially linear (walls of 401 and 403 are substantially linear)."

14. Regarding claim 45 Raman in view of Baughman et al. teaches the claimed limitations as set forth above regarding claim 1, except for "wherein a length of each of the first peninsula and the second peninsula is in a range of approximately 30 microns to approximately 52 microns." It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the length of the peninsulas in the given range for the purpose of utilizing an optimum range. The applicant should note that it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the

art and is not inventive. *In re Aller*, 105 USPQ 233. One would have been motivated to so modify Raman for the benefit of reducing the size to produce a higher quality of printing by using smaller ink drops.

15. Claims 11 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Weber et al. (US 5734399). Raman discloses "a chamber (101 of Fig 1); a first fluid channel and a second fluid channel each communicated with the chamber (301, 303 of Fig 4); a first peninsula extended along the first fluid channel and a second peninsula extended along the second fluid channel (401, 403 of Fig 4); and a first sidewall extended between the first peninsula and the chamber, and a second sidewall extended between the second peninsula and the chamber (walls between 401, 403 and 109 in Fig 4), wherein the first sidewall is oriented at a first angle to the chamber and the second sidewall is oriented at a second angle to the chamber (see Fig 4), wherein the second angle is less than the first angle (angle between 401 and 101 is opposite of angle between 403 and 101 of Fig 4, i.e. one angle is 60, while the other is opposite, -60)." Thus Raman meets the claimed invention except "wherein a length of the first fluid channel along the first peninsula is substantially parallel with a length of the second fluid channel along the second peninsula."

16. Weber et al. teach "a length of the first fluid channel along the first peninsula is substantially parallel with a length of the second fluid channel along the second peninsula (see C1 and C2 of Fig 4 where the vertical lengths of each of the channels are parallel)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have lengths of each of the channels be parallel. One would

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have been motivated to so modify Raman for the benefit of achieving the desired fluidic pressure or fluid motion into the chambers.

17. Regarding claim 51 Raman in view of Baughman et al. teaches the claimed limitations as set forth above regarding claim 11, except for “wherein a length of each of the first peninsula and the second peninsula is in a range of approximately 30 microns to approximately 52 microns.” It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the length of the peninsulas in the given range for the purpose of utilizing an optimum range. The applicant should note that it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and is not inventive. *In re Aller*, 105 USPQ 233. One would have been motivated to so modify Raman for the benefit of reducing the size to produce a higher quality of printing by using smaller ink drops.

18. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Weber et al. and further in view of Pidwerbecki et al. (US 6161923).

19. Regarding claim 9, Raman in view of Weber et al. discloses the claimed invention as set forth above with respect to claim 11. Thus Raman in view of Weber et al. meets the claimed invention except “a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42 microns.”

20. Pidwerbecki et al. teach “a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42

microns.” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the combined width of the fluid channels within the range of approximately 34 to 42 microns. One would have been motivated to so modify Raman in view of Weber et al. for the benefit of reducing the size to produce a high quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

21. Regarding claim 10, Raman in view of Weber et al. discloses the claimed invention as set forth above with respect to claim 11. Thus Raman in view of Weber et al. meets the claimed invention except “a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns.”

22. Pidwerbecki et al. teach “a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns (col 6 ln 13-14).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the length of the channels within the range of approximately 29-31 microns. One would have been motivated to so modify Raman for the benefit of reducing the size to produce a high quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

23. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Weber et al. and further in view of Burke et al. Raman in view of Weber et al. discloses the claimed invention as set forth above with respect to claim 11. Thus Raman in view of Weber et al. meets the claimed invention except “the first angle of the

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first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and wherein the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees.”

24. Burke et al. teach “the first angle of the first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and wherein the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees (col 5 ln 13-15).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the angles of the sidewalls fall in a range of approximately 43 to 46 degrees and approximately 30 to 34 degrees. One would have been motivated to so modify Raman in view of Weber et al. for the benefit of creating a configuration that results in a higher rate of available printing since the ink chamber is not starved for ink as stated by Burke et al. in column 5 lines 5-11.

25. Claims 13-21, 47, 48, 52, 53, 56, and 57 are rejected under 35 U.S.C. 103(a) as being anticipated by Burke et al. (US 5666143) in view of Weber et al.

26. Regarding claim 13, Burke et al. disclose “a chamber (101 of Fig 1); a first fluid channel and a second fluid channel each communicated with the chamber (317, 315 of Fig 5); and an island separating the first fluid channel and the second fluid channel (305 of Fig 5), wherein the island is substantially rectangular and has a first side and a first chamfered corner each along the first fluid channel and a second side and a second chamfered corner each along the second fluid channel, wherein the first chamfered corner is oriented at a first angle and the second chamfered corner is oriented at a second angle less than the first angle (305 is substantially rectangular and has its right-

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most corners, one along each channel, chamfered at opposite angles, i.e. if one angle is 45, the other is -45)." Thus Burke et al. meet the claimed invention except "wherein a width of the first fluid channel along the first side of the island is substantially constant, and a width of the second fluid channel along the second side of the island is substantially constant."

27. Weber et al. teach "a width of the first fluid channel along the first side of the island is substantially constant, and a width of the second fluid channel along the second side of the island is substantially constant (see C1 and C2 of Fig 4)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the widths of the channels substantially constant. One would have been motivated to so modify Burke et al. for the benefit of achieving the desired fluidic pressure or fluid motion into the chambers by making the widths of the channels uniform.

28. Regarding claim 14, Burke et al. further disclose "a resistor in the chamber (109' of Fig 5)."

29. Regarding claim 15, Burke et al. further disclose "a first peninsula extended along the first fluid channel and a second peninsula extended along the second fluid channel (503, 501 of Fig 5); and a first sidewall extended between the first peninsula and the chamber and a second sidewall extended between the second peninsula and the chamber (wall of 503 and wall of 501 of Fig 5)."

30. Regarding claim 16, Burke et al. further disclose "the first sidewall is oriented at a first angle to the chamber and the second sidewall is oriented at a second angle to the

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chamber, wherein the second angle is less than the first angle (the angle between the wall of 501 and the chamber is less than the angle between the wall of 503 and the chamber in Fig 5)."

31. Regarding claim 17, Burke et al. further disclose "the first angle of the first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees (col 5 ln 13-15)."

32. Regarding claim 18, Burke et al. further disclose "the first sidewall is oriented substantially parallel with the first chamfered corner of the island and the second sidewall is oriented substantially parallel with the second chamfered corner of the island (the upper right chamfered corner is substantially parallel to the wall of 503 and the lower right chamfered corner is substantially parallel to the wall of 501)."

33. Regarding claim 19, Burke et al. further disclose "wherein the first peninsula is oriented substantially parallel with the first side of the island and the second peninsula is oriented substantially parallel with the second side of the island (the upper right side of 305 is substantially parallel to the wall of 503 and the lower right side of 305 is substantially parallel to the wall of 501)."

34. Regarding claim 20, Weber et al. further disclose "a width of the first fluid channel along the first chamfered corner...is substantially constant, and a width of the second fluid channel along the second chamfered corner...is substantially constant (see C1 and C2 of Fig 4)."

35. Regarding claim 21, Burke et al. disclose "a chamber (101 of Fig 1); a first fluid channel and a second fluid channel each communicated with the chamber (317, 315 of Fig 5); an island separating the first fluid channel and the second fluid channel (305 of Fig 5), a first peninsula extended along the first fluid channel and a second peninsula extended along the second fluid channel (503, 501 of Fig 5); and a first sidewall extended between the first peninsula and the chamber along the first fluid channel and a second sidewall extended between the second peninsula and the chamber along the second fluid channel (wall of 503 and wall of 501 of Fig 5), wherein the island is substantially rectangular and has a first side and a first chamfered corner each along the first fluid channel and a second side and a second chamfered corner each along the second fluid channel, wherein the first chamfered corner is oriented at a first angle and the second chamfered corner is oriented at a second angle less than the first angle (305 is substantially rectangular and has its right-most corners, one along each channel, chamfered at opposite angles, i.e. if one angle is 45, the other is -45)." Thus Burke et al. meet the claimed invention except "wherein the first sidewall as provided along the first fluid channel is oriented substantially parallel with the first chamfered corner as provided along the first fluid channel, and the second sidewall as provided along the second fluid channel is oriented substantially parallel with the second chamfered corner as provided along the second fluid channel."

36. Weber et al. teach "the first sidewall as provided along the first fluid channel (angled sidewall of channel 411 of Fig 4) is oriented substantially parallel with the first chamfered corner as provided along the first fluid channel (upper left corner of island

417 of Fig 4), and the second sidewall as provided along the second fluid channel (angled sidewall of channel 409 of Fig 4) is oriented substantially parallel with the second chamfered corner as provided along the second fluid channel (upper right corner of island 417 of Fig 4).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the sidewalls substantially parallel with the chamfered corners. One would have been motivated to so modify Burke et al. for the benefit of reducing the chance that a particle will become lodged over the heater resistor, as stated by Weber et al.

37. Regarding claim 53, Burke et al. disclose “a chamber (101 of Fig 1); a first fluid channel and a second fluid channel each communicated with the chamber (317, 315 of Fig 5); an island separating the first fluid channel and the second fluid channel (305 of Fig 5), a first peninsula extended along the first fluid channel and a second peninsula extended along the second fluid channel (503, 501 of Fig 5); and a first sidewall extended between the first peninsula and the chamber along the first fluid channel and a second sidewall extended between the second peninsula and the chamber along the second fluid channel (wall of 503 and wall of 501 of Fig 5), wherein the island is substantially rectangular and has a first side and a first chamfered corner each along the first fluid channel, and a second side and a second chamfered corner each along the second fluid channel, wherein the first chamfered corner is oriented at a first angle and the second chamfered corner is oriented at a second angle different than the first angle (305 is substantially rectangular and has its right-most corners, one along each channel, chamfered at opposite angles, i.e. if one angle is 45, the other is -45).” Thus

Burke et al. meet the claimed invention except “wherein the first peninsula as provided along the first fluid channel is oriented substantially parallel with the first side of the island as provided along the first fluid channel, and the second peninsula as provided along the second fluid channel is oriented substantially parallel with the second side of the island as provided along the second fluid channel.”

38. Weber et al. teach “the first peninsula as provided along the first fluid channel (411 of Fig 4) is oriented substantially parallel with the first side of the island as provided along the first fluid channel (left vertical side of island 417 parallel to peninsula of Fig 4), and the second peninsula as provided along the second fluid channel (409 of Fig 4) is oriented substantially parallel with the second side of the island as provided along the second fluid channel (right vertical side of island 417 parallel to peninsula of Fig 4).” It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the peninsulas substantially parallel to sides of the island. One would have been motivated to so modify Burke et al. for the benefit of reducing the chance that a particle will become lodged over the heater resistor, as stated by Weber et al.

39. Regarding claims 47 and 56, Burke et al. in view of Weber et al. disclose the claimed invention as set forth above regarding claims 21 and 53, respectively. Burke et al. further disclose “the first sidewall is oriented at a first angle to the chamber and the second sidewall is oriented at a second angle to the chamber, wherein the first angle of the first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and wherein the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees (col 5 ln 13-15).”

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40. Regarding claims 48 and 57, Burke et al. in view of Weber et al. disclose the claimed invention as set forth above regarding claims 15 and 53, respectively, except for "wherein a length of each of the first peninsula and the second peninsula is in a range of approximately 30 microns to approximately 52 microns." It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the length of the peninsulas in the given range for the purpose of utilizing an optimum range. The applicant should note that it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and is not inventive. *In re Aller*, 105 USPQ 233. One would have been motivated to so modify Burke et al. for the benefit of reducing the size to produce a higher quality of printing by using smaller ink drops.

41. Regarding claim 52, Burke et al. in view of Weber et al. disclose the claimed invention as set forth above regarding claim 21 except for "wherein a length of each of the first peninsula and the second peninsula is in a range of approximately 30 microns to approximately 52 microns." It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the length of the peninsulas in the given range for the purpose of utilizing an optimum range. The applicant should note that it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and is not inventive. *In re Aller*, 105 USPQ 233. One would have been motivated to so modify Burke et al. in view of Weber et al. for the benefit of reducing the size to produce a higher quality of printing by using smaller ink drops.

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42. Claims 22, 23, 49, 50, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. in view of Weber et al. and further in view of Pidwerbecki et al.

43. Regarding claims 22, 49, and 54, Burke et al. in view of Weber et al. disclose the claimed invention as set forth above with respect to claim 21, claim 13 and claim 53, respectively. Thus Burke et al. in view of Weber et al. meet the claimed invention except "a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42 microns."

44. Pidwerbecki et al. teach "a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42 microns." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the combined width of the fluid channels within the range of approximately 34 to 42 microns. One would have been motivated to so modify Burke et al. in view of Weber et al. for the benefit of reducing the size to produce a high quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

45. Regarding claims 23, 50, and 55 Burke et al. in view of Weber et al. disclose the claimed invention as set forth above with respect to claim 21, claim 13, and claim 53, respectively. Thus Burke et al. in view of Weber et al. meet the claimed invention except "a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns."

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46. Pidwerbecki et al. teach "a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns (col 6 ln 13-14)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the length of the channels within the range of approximately 29-31 microns. One would have been motivated to so modify Burke et al. in view of Weber et al. for the benefit of reducing the size to produce a high quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

47. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Baughman et al. and further in view of Pidwerbecki et al.

48. Regarding claim 43, Raman in view of Baughman et al. discloses the claimed invention as set forth above regarding claim 1. Thus Raman in view of Baughman et al. meets the claimed invention except "a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42 microns."

49. Pidwerbecki et al. teach "a combined minimum width of the first fluid channel and the second fluid channel is in a range of approximately 34 microns to approximately 42 microns." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the combined width of the fluid channels within the range of approximately 34 to 42 microns. One would have been motivated to so modify Raman in view of Baughman et al. for the benefit of reducing the size to produce a high

quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

50. Regarding claim 44, Raman in view of Baughman et al. discloses the claimed invention as set forth above regarding claim 1. Thus Raman in view of Baughman et al. meets the claimed invention except "a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns."

51. Pidwerbecki et al. teach "a minimum length of each of the first fluid channel and the second fluid channel is in a range of approximately 29 microns to approximately 31 microns (col 6 ln 13-14)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the length of the channels within the range of approximately 29-31 microns. One would have been motivated to so modify Raman in view of Baughman et al. for the benefit of reducing the size to produce a high quality of printing by using smaller ink drops as stated by Pidwerbecki et al. in column 6 lines 4-7.

52. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raman in view of Baughman et al. and further in view of Burke et al. Raman in view of Baughman et al. discloses the claimed invention as set forth above regarding claim 1. Thus Raman in view of Baughman et al. meets the claimed invention except "the first angle of the first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and wherein the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees."

53. Burke et al. teach "the first angle of the first sidewall is in a range of approximately 43 degrees to approximately 46 degrees, and wherein the second angle of the second sidewall is in a range of approximately 30 degrees to approximately 34 degrees (col 5 ln 13-15)." It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have the angles of the sidewalls fall in a range of approximately 43 to 46 degrees and approximately 30 to 34 degrees. One would have been motivated to so modify Raman in view of Baughman et al. for the benefit of creating a configuration that results in a higher rate of available printing since the ink chamber is not starved for ink as stated by Burke et al. in column 5 lines 5-11.

Response to Arguments

54. Applicant's arguments with respect to claims 1-23 and 43-57 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

55. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any


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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Goldberg whose telephone number is 571-272-2728. The examiner can normally be reached on Monday through Friday, 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brian Goldberg 
AU 2861
March 16, 2007



MATTHEW LUU
PRIMARY EXAMINER